



Getting On Track:

Record Transit Ridership Increases
Energy Independence



Getting On Track:

Record Transit Ridership Increases Energy Independence



Rob McCulloch
Environment America Research and Policy Center

Philip Faustmann and Jessica Darmawan
Environment America Research and Policy Center

September, 2009

Acknowledgements

The authors would like to thank Tony Dutzik, Frontier Group and Robert Padgett, American Public Transit Association, for their review of this report.

The generous financial support of the Rockefeller Foundation and the Surdna Foundation made this report possible.

The opinions expressed in this report are those of the authors and do not necessarily reflect the views of our funders or those who provided review. Any factual errors are strictly the responsibility of the author.

© 2009 Environment America Research & Policy Center

Environment America Research & Policy Center is a 501(c)(3) organization. We are dedicated to protecting America's air, water and open spaces. We investigate problems, craft solutions, educate the public and decision makers, and help Americans make their voices heard in local, state and national debates over the quality of our environment and our lives. For more information about Environment America Research & Policy Center or for additional copies of this report, please visit www.EnvironmentAmerica.org.

Cover photo: Sam Churchill

Layout: Jenna Leschuk, Ampersand Mountain Creative

Table of Contents

Executive Summary	1
Context	
The Relationship Between Transportation and Oil Dependence	2
Public Transportation Sees Record Growth In 2008	2
Public Transportation = Less Pollution, Less Oil	2
Relationship Between Transportation And Global Warming Pollution	3
VMT Drops, Transit Steps In	4
Environmental Benefits From Public Transportation - 2008	6
State Benefits From Public Transportation—2008	6
Public Transportation Continues Growth In 2009	8
Transit Systems Facing Crisis	8
Opportunities and Recommendations	
Public Transportation—Where Are We Going?	15
Conclusion	16
Methodology	18
Endnotes	19

Executive Summary

Transportation is responsible for more than two-thirds of our nation's oil consumption and nearly a third of our carbon dioxide emissions. To make us more energy independent and reduce pollution, we need to build a transportation system that uses less oil, takes advantage of alternative fuels, and shifts as much of our travel as possible from transportation modes that consume a lot of energy to those that consume less.

Public transportation meets this need by getting people to work and school using less oil and creating less pollution than driving. Last year, people drove fewer miles and replaced many of these trips by using more public transportation—record growth that has largely carried over to 2009. Many states saw dramatic, record-breaking growth in annual transit ridership last year, as detailed in Table 1.

Nationwide, in 2008 transit ridership rose by 4 percent and people drove nearly 4 percent less than they did the year before. Overall, Americans took approximately 10.7 billion trips via public transportation last year, saving more than 4 billion gallons of gasoline. This is equivalent to the gasoline used by more than 7.2 million cars a year—nearly as many cars as are registered in Florida, the fourth largest state. While this is a major step towards reducing our dependence on oil, our country needs to make long strides in advancing more efficient transportation in order to achieve energy independence. In 2008, the U.S. spent more than \$700 billion on oil, of which nearly \$400 billion was spent on petroleum from other countries.¹ If we doubled the nation's current ridership of public transportation, we could reduce oil usage in this country comparable to what we import each year from Saudi Arabia.

In terms of global warming, public transportation reduced carbon dioxide emissions, the leading cause of climate change, by 37 million tons in 2008. The latest science indicates that we need to reduce global warming pollution 80 percent below 1990 levels by 2050 to stave off the most severe impacts of climate change. Meeting this goal will require emissions reductions from all sectors of the economy, especially the transportation sector, which is the second largest and fastest growing source of carbon dioxide pollution.

This report details the dramatic growth of public transportation in 2008, and the corresponding energy and environmental benefits. These details are viewed in light of fewer miles driven in most states last year. It also documents transit growth across the country continuing into this year, highlights future potential benefits and outlines ways to improve the state of public transportation.

Table 1—States with strong transit ridership growth, 2008

STATE	Percent annual increase/decrease 2008
North Carolina	16%
Louisiana	16%
Maryland	15%
Arizona	12%
Delaware	10%
Utah	10%
Idaho	10%
Washington	9%
Indiana	9%
Colorado	8%
Missouri	8%
Georgia	8%
South Carolina	7%
California	6%
Michigan	6%
Oklahoma	6%
New Hampshire	6%
Illinois	6%
Connecticut	5%
Minnesota	5%
Rhode Island	5%
Arkansas	5%
Iowa	5%
Kentucky	5%
New Jersey	5%
Nevada	5%
Vermont	4%
Virginia	4%
Pennsylvania	4%
Maine	3%
Massachusetts	3%
District of Columbia	3%
Florida	3%
Kansas	3%

The Relationship Between Transportation and Oil Dependence

In the United States, about two-thirds of all oil use is for transportation, or nearly 13 million barrels of oil per day. However, the U.S. only produces 8.5 million barrels of oil a day domestically, making us dependent on other countries to support our oil dependency.²

As a percentage of total U.S. oil consumption, net oil imports have risen from about 36 percent in 1975 to 58 percent in 2007.³

Of the energy used in the transportation sector, nearly all of it (98 percent) is derived from petroleum products.⁴ Today, alternative fuel vehicles are only 4 percent of the entire automobile fleet in the United States. As a result of their higher cost and strong competition from conventional gasoline-powered vehicles, alternative fuel vehicles and gasoline hybrids are likely to have only a modest, albeit growing, potential for reducing U.S. oil use in the coming decades. By 2035, projected market share of vehicles with cleaner technologies alone would reduce oil consumption by 10 percent below 2000 levels.⁵

Enacted after the oil shocks of the 1970's, federal and state Corporate Average Fuel Economy (CAFE) standards have been a critical factor in moderating gasoline demand growth, even while the number of cars on the road and the miles they traveled increased.

In 2008, gas price spikes combined with the economic recession to temper demand for transportation fuels, resulting in a drop in overall U.S. oil consumption. Oil demand decreased 6 percent from 2007 to 2008, from 20.7 million barrels of oil consumed per day to 19.5 million barrels per day.⁶

Public Transportation Sees Record Growth In 2008

As an alternative to driving, public transportation usage rose sharply in 2008. Americans took 10.7 billion transit trips last year, the highest level of ridership in 52 years.⁷ This represents a 4 percent increase over the number of trips taken in 2007 on public transportation, while at the same time, Vehicle Miles Traveled (VMT) on our nation's roads declined by 3.6 percent in 2008.⁸

This transit ridership record continues a long-term trend of public transportation growth. Since 1995, transit usage has averaged 2.5 percent annual growth, almost triple (2.5 times) the population growth rate and nearly double (1.8 times) the growth rate for VMT on our nation's highways for the same period.⁹

Record ridership shows clear, growing demand for public trans-



▲ Transportation accounts for about two-thirds of all U.S. oil use—nearly 13 million barrels of oil per day. (Photo: Matt Lemmon.)

portation. In 2008 the following transit modes saw significant growth:

- Light rail (modern streetcars and trolleys) had the highest percentage of annual ridership growth among all modes—an 8.3 percent increase.
- Heavy rail (subway) ridership rose 3.5 percent.
- Commuter rail ridership increased by 3.9 percent.
- Bus service saw an increase of 3.9 percent and in communities with a population of less than 100,000, bus services saw an annual ridership increase of 9.3 percent.¹⁰

Public Transportation = Less Pollution, Less Oil

The record number of transit trips taken in 2008 saved as much gasoline as is consumed by 7.2 million cars in a year; by comparison, Florida, the nation's fourth biggest state, had 7.4 million cars registered in 2007.¹¹ While public transportation also uses significant amounts of fuel, it helps to conserve fuel and reduce pollution by carrying more passengers on a per mile basis than cars with single occupants.

Rail transit, such as subways and light rail, emit little or no pollution. Other public transportation options, such as buses and commuter rail, primarily use diesel. With advances in cleaner and renewable fuels, public transportation is becoming more efficient and less polluting over time, and many newer transit vehicles are powered by cleaner diesel, compressed natural gas, liquefied natural gas, hydrogen fuel cells, and hybrid technology. Already, public transportation consumes about half the energy of automobiles on a per mile basis.¹² These advances will further reduce public transportation's reliance on oil and reduce emissions.

The Relationship Between Transportation and Global Warming Pollution

Transportation is the second largest source of global warming emissions, behind electricity production, and the fastest growing source of such pollution, accounting for nearly half of the increase in total U.S. global warming emissions over the past two decades.¹³

Global warming emissions from transportation are a result of three factors:

- Fuel efficiency and technology
- Lifecycle carbon emissions of fuels
- How much people drive, as measured in VMT

In terms of efficiency, the Obama administration announced new CAFE guidelines that incorporate California's advanced emissions standards to raise fuel efficiency, as expressed in miles per gallon (mpg) of gasoline. In May 2009, the administration proposed raising the CAFE standard for new cars and trucks to have a fleet average of 35.5 mpg by 2016. Currently, new cars need to average 27.5 mpg and trucks must average 24 mpg. Right now America's entire passenger vehicle fleet averages about 20.8 mpg, creating approximately 19.4 pounds of carbon dioxide emissions per gallon of gasoline burned.¹⁴

Furthermore, current advances in lower carbon fuels, such as biodiesel, cellulosic ethanol and clean electricity may have significant potential for reducing transportation oil use. Right now, Congress is working to pass legislation that would encourage the development of lower carbon transportation fuels. In addition, 11 states in the Eastern and Mid-Atlantic region have committed to develop a single low-carbon fuel standard to create a larger market for cleaner fuels.

While CAFE standards are achieving gains in fuel efficiency and our country is making strides in low carbon fuels, this progress will be offset if people continue to drive at present levels. Current land use policies, development patterns, and the transportation infrastructure investments they entail tend to encourage driving, which will result in a net increase in transportation sector oil consumption and global warming pollution if VMT growth continues on its present course.

Between 1977 and 2007, driving (as measured in VMT)

doubled, while the country's population increased by little more than a third. While recent years have seen a leveling off of per-capita VMT growth, current models estimate continued growth in overall miles driven, with a 60 percent increase in total VMT through 2030 if policies continue to promote land development with automobiles as the primary mode of transport.¹⁵ Overall VMT is expected to grow over the long run due to population growth and travel behavior characterized by increases in trip frequency, increases in trip length and distance, and a growing reliance on single occupant cars and trucks for trips necessitated by current development patterns.¹⁶

Land use patterns and policies in the United States are driven by the need for highways and parking for increasing numbers of cars and trucks—presently, the U.S. has more registered vehicles in total (244 million) and per capita (81 per 100 residents) than any other country in the world.¹⁷ Vast urban and suburban sprawl necessitates frequent automobile use for everyday activities—multiple trips daily for work, school, shopping and entertainment.

In addition to the large quantities of fuel consumed and global warming emissions produced, this car dependency negatively impacts the environment in other ways:

- Decreased air quality due to smog and other air pollutants from vehicles;
- Decreased water quality due to highway storm-water runoff (one of the largest contributors to groundwater contamination)¹⁸;
- Loss of open space, farms and wetlands as land



▲ In 2008, light rail had the highest percentage of annual ridership growth among all transit modes—an 8.3 percent increase. (Photo - Houston Light Rail, Ed Schipul.)



▲ With advances in cleaner fuels, like this bus running in compressed natural gas, public transportation is becoming more efficient and less polluting over time. (Photo - So Cal Metro.)

is consumed for low-density housing and commercial development;

- Heat-island effects, whereby urban temperatures increase due to concentrations of roads and paved

parking lots with high surface radiative properties; and

- Increased energy and resource consumption for transporting goods and people within and between sprawling communities.

VMT Drops, Transit Steps In

In 2008, overall miles driven dropped to the lowest level in five years. A significant contributing factor to reduced driving was a 16 percent increase in fuel prices, from \$2.81 per gallon in 2007 to \$3.26 per gallon in 2008.¹⁹ While people generally travel less during times of reduced economic activity and higher fuel prices, state VMT and transit agency data suggest a correlation where increased transit replaces many trips that would otherwise be taken in passenger cars.²⁰ Nationwide, transit is estimated to reduce VMT by more than 102 billion miles driven per year.²¹

The proportion of trips replaced by transit varies widely, from 1 or 2 percent in non-urban areas with minimal transit services, to up to nearly half of reduced automobile trips in dense urban areas with comprehensive transit systems such as Washington, D.C.

Regardless of urban density or prevalence of transit, last year's VMT and ridership statistics suggest that the fewer miles people drove, the more they utilized transit. This is demonstrated in the Table 2, accruing benefits to nearly all states:

- States containing dense urban metropolitan areas with extensive public transportation systems such as Pennsylvania, New Jersey, and Illinois;

Table 2: Transit ridership, Vehicle Miles Traveled (VMT) by state, 2007-2008

	2007 population	2008 population	2007 transit trips (1,000s)	2008 transit trips (1,000s)	Increase/decrease	2007 vehicle miles traveled (millions)	2008 VMT (millions)	VMT increase/decrease
<i>Tier 1 - These states saw significantly reduced VMT and significantly increased transit ridership in 2008</i>								
Louisiana	4,373,310	4,410,796	20,826	24,062	16%	38,070	36,364	-4%
Maryland	5,618,899	5,633,597	135,937	156,070	15%	52,159	50,321	-4%
Delaware	861,953	873,092	8,786	9,669	10%	8,658	8,390	-3%
Utah	2,668,925	2,736,424	43,911	48,130	10%	21,677	20,810	-4%
Idaho	1,496,145	1,523,816	2,650	2,902	10%	13,143	12,934	-2%
Indiana	6,335,862	6,376,792	27,653	30,023	9%	61,270	58,880	-4%
Colorado	4,842,770	4,939,456	94,044	101,932	8%	45,839	44,630	-3%
Missouri	5,878,399	5,911,605	72,141	77,614	8%	59,061	56,698	-4%
Georgia	9,523,297	9,685,744	161,821	173,985	8%	102,058	97,250	-5%
South Carolina	4,404,914	4,479,800	8,699	9,320	7%	45,874	44,192	-4%
California	36,377,534	36,756,666	1,338,795	1,423,980	6%	302,352	286,706	-5%

	2007 population	2008 population	2007 transit trips (1,000s)	2008 transit trips (1,000s)	Increase/ decrease	2007 vehicle miles traveled (millions)	2008 VMT (millions)	VMT increase/ decrease
Michigan	10,049,790	10,003,422	86,377	91,649	6%	96,521	92,163	-5%
Oklahoma	3,608,123	3,642,361	6,540	6,913	6%	40,329	38,645	-4%
Illinois	12,825,809	12,901,563	632,116	667,589	6%	94,254	90,483	-4%
Connecticut	3,489,868	3,501,252	37,343	39,394	5%	30,116	28,692	-5%
Rhode Island	1,053,136	1,050,788	24,023	25,296	5%	8,235	7,810	-5%
Iowa	2,983,360	3,002,555	21,647	22,709	5%	25,813	23,743	-8%
New Jersey	8,653,126	8,682,661	338,913	354,616	5%	70,214	67,405	-4%
Virginia	7,698,775	7,769,089	68,320	71,071	4%	75,933	72,896	-4%
Pennsylvania	12,419,930	12,448,279	462,577	479,987	4%	97,464	93,355	-4%
<i>Tier 2 - These states saw moderately reduced VMT and significantly increased transit ridership in 2008</i>								
North Carolina	9,041,594	9,222,414	45,437	52,697	16%	92,061	89,783	-2%
Arizona	6,353,421	6,500,180	78,089	87,084	12%	55,848	56,144	1%
Washington	6,449,511	6,549,224	189,496	206,886	9%	51,220	50,145	-2%
New Hampshire	1,312,256	1,315,809	1,326	1,401	6%	12,454	12,329	-1%
Minnesota	5,182,360	5,220,393	95,357	100,450	5%	53,773	52,697	-2%
Arkansas	2,830,557	2,830,557	7,193	7,558	5%	27,670	26,819	-3%
Nevada	2,554,344	2,600,167	74,262	77,684	5%	20,156	20,262	1%
Kentucky	1,964,402	1,984,356	25,485	26,673	5%	41,439	41,439	0%
Kansas	2,777,382	2,802,134	5,209	5,344	3%	26,093	25,493	-2%
<i>Tier 3 - These states saw significantly reduced VMT and moderately increased transit ridership in 2008</i>								
Maine	1,315,398	1,316,456	2,915	3,016	3%	13,638	12,742	-7%
Massachusetts	6,467,915	6,497,967	393,007	406,524	3%	52,463	49,583	-5%
Washington, DC	587,868	591,833	415,395	428,905	3%	3,541	3,330	-6%
Florida	18,199,526	18,328,340	262,596	269,422	3%	187,502	186,658	-0%
New York	19,429,316	19,490,297	3,811,939	3,906,545	2%	126,137	119,050	-6%
Tennessee	6,149,116	6,214,888	28,792	29,499	2%	63,217	60,688	-4%
Oregon	3,735,549	3,790,060	123,456	126,156	2%	30,794	29,716	-4%
New Mexico	1,964,402	1,984,356	11,042	11,223	2%	21,317	21,348	0%
West Virginia	1,809,836	1,814,468	3,809	3,854	1%	18,168	17,535	-3%
<i>Tier 4 - These states saw minimal or no reductions in VMT and/or minimal or no increased transit ridership in 2008</i>								
Vermont	620,748	621,270	3,408	3,549	4%	7,003	7,073	1%
Texas	23,843,432	24,326,974	291,738	297,508	2%	212,228	204,155	-4%
Wisconsin	5,598,893	5,627,967	73,380	74,722	2%	53,065	51,367	-3%
Ohio	11,477,641	11,485,910	135,463	135,844	0%	98,015	94,095	-4%
Alabama	4,626,595	4,661,900	4,965	4,919	-1%	53,837	50,373	-6%
Mississippi	2,921,030	2,938,618	1,283	1,108	-14%	37,530	37,668	0%

Sources: Federal Highway Administration, Traffic Volume Trends 1998-2007; Governors Highway Safety Association 2008; American Public Transportation Association Ridership Report 2008; National Transit Database. Some states were omitted due to incomplete VMT and/or transit ridership data, to include AK, HI, MT, ND, NE, PR, SD and WY.

- States with a dominant urban center with transit systems such as Georgia, Louisiana, and Utah; and
- States containing mid-sized metropolitan areas with modest but growing transit systems such as Arkansas, Iowa, and Oklahoma.

Furthermore, even states with minimal reductions in VMT still saw appreciable gains in public transportation usage where significant system expansion allowed these networks to meet burgeoning local demand for transit service, such as North Carolina and Arizona.

Environmental Benefits From Public Transportation - 2008

Public transportation is an effective way to reduce transportation energy use and carbon dioxide pollution. Each year, commuters that choose transit over driving help cut energy use in the transportation sector by an amount equivalent to 1.8 billion gallons of gasoline nationally, and reduce carbon dioxide emissions by 16.2 million metric tons. Furthermore, combined with savings realized by reduced congestion and secondary land use and travel reduction impacts, transit reduces overall national energy use by an amount equivalent to 4.2 billion gallons of gasoline, and cuts carbon dioxide emissions by 37 million metric tons annually.²²

State Benefits From Public Transportation - 2008

An estimated 14 million Americans ride public transportation each weekday, representing about 5 percent of the U.S. working population. If this level doubled to one in 10 working Americans regularly using transit, U.S. reliance on foreign oil could decline by more than 40 percent, or nearly the amount of oil imported from Saudi Arabia each year.²³

Table 4 illustrates fuel and carbon savings from each state



▲ Nationwide, transit is estimated to reduce vehicle miles traveled (VMT) by more than 102 billion miles driven per year. (Photo—Jessica Darmawan)

in 2008 due to increased transit ridership. In order to fully capitalize on opportunities to reduce oil dependence, transit investment must both benefit established transit strongholds in urban areas, as well as seize growth potential in promising states like Iowa, Kansas, Maine, New Mexico, North and South Carolina, New Hampshire and Vermont, which have moderately-sized cities and majority non-urban populations, yet rapidly rising demand for transit services.²⁴

Table 3—National energy, environmental benefits from public transportation, 2008

	Energy savings (in billions of gasoline equivalent)	CO ₂ emission reduction (million metric tons)
Reduction by direct use of public transportation (vs. private vehicle usage)	1.80	16.20
Fuel consumed by public transportation vehicles	-1.38	-12.30
Reduction via congestion mitigation	0.34	3.00
Secondary reduction via reduced travel distance facilitated by public transportation availability	3.40	30.10
TOTAL REDUCTION	4.16	37.00

Sources: ICF International, SAIC

Table 4: Fuel, carbon reductions via transit usage, 2008

	2007—2008 transit trips increase (1,000s)	2008 total transit trips (1,000s)	2008 total gallons of gasoline saved through transit	2008 total tons CO₂ reduced through transit	Equivalent annual gasoline savings in numbers of cars
Alabama	-50	4,900	1,913,000	17,000	3,300
Arizona	8,990	87,000	33,875,000	305,000	58,700
Arkansas	370	7,500	2,940,000	26,000	5,000
California	85,180	1,423,900	553,928,000	4,992,000	960,100
Colorado	7,890	101,900	39,651,000	357,000	68,700
Connecticut	2,050	39,300	15,324,000	137,000	26,500
Delaware	880	9,600	3,761,000	33,000	6,500
District of Columbia	13,510	428,900	166,843,000	1,503,000	289,100
Florida	6,830	269,400	104,805,000	944,000	181,600
Georgia	12,160	173,900	67,680,000	609,000	117,300
Idaho	250	2,900	1,128,000	9,000	1,900
Illinois	35,470	667,500	259,692,000	2,340,000	450,100
Indiana	2,370	30,000	11,679,000	105,000	20,200
Iowa	1,060	22,700	8,833,000	79,000	15,300
Kansas	140	5,300	2,078,000	18,000	3,600
Kentucky	1,190	26,600	10,375,000	93,000	17,900
Louisiana	3,240	24,000	9,360,000	84,000	16,200
Maine	100	3,000	1,173,000	10,000	2,000
Maryland	20,130	156,000	60,711,000	547,000	105,200
Massachusetts	13,520	406,500	158,137,000	1,425,000	274,100
Michigan	5,270	91,600	35,651,000	320,000	61,700
Minnesota	5,090	100,400	39,075,000	352,000	67,700
Mississippi	-170	1,100	431,000	3,000	700
Missouri	5,470	77,600	30,191,000	271,000	52,300
Nevada	3,420	77,600	30,218,000	271,000	52,300
New Hampshire	70	1,400	544,000	4,000	900
New Jersey	15,700	354,600	137,945,000	1,243,000	239,100
New Mexico	180	11,200	4,365,000	39,000	7,500
New York	94,610	3,906,500	1,519,646,000	13,696,000	2,634,000
North Carolina	7,260	52,600	20,499,000	184,000	35,500
Ohio	380	135,800	52,843,000	475,000	91,500
Oklahoma	370	6,900	2,688,000	23,000	4,600
Oregon	2,700	126,100	49,074,000	442,000	85,000
Pennsylvania	17,410	479,900	186,714,000	1,682,000	323,600
Puerto Rico	710	29,000	11,292,000	101,000	19,500
Rhode Island	1,270	25,200	9,840,000	88,000	17,000

	2007—2008 transit trips increase (1,000s)	2008 total transit trips (1,000s)	2008 total gallons of gasoline saved through transit	2008 total tons CO₂ reduced through transit	Equivalent annual gasoline savings in numbers of cars
South Carolina	620	9,300	3,625,000	32,000	6,200
Tennessee	710	29,400	11,475,000	102,000	19,800
Texas	5,770	297,500	115,730,000	1,042,000	200,500
Utah	4,220	48,100	18,722,000	168,000	32,400
Vermont	140	3,500	1,380,000	11,000	2,300
Virginia	2,750	71,000	27,646,000	249,000	47,900
Washington	17,390	206,800	80,478,000	724,000	139,400
West Virginia	40	3,800	1,499,000	13,000	2,500
Wisconsin	1,340	74,700	29,066,000	261,000	50,300
Other states*	4,000	92,000	35,788,000	322,000	62,000
Other modes**	18,000	477,000	185,553,000	1,672,000	321,600
TOTAL	430,000		4,155,864,000	37,423,000	7,201,100

Sources: Environment America Research and Policy Center, American Public Transportation Association Ridership Report 2008; National Transit Database. *Estimated transit ridership for AK, HI, MT, ND, NE, PR, SD and WY based on available 2007 and 2008 reported ridership. **Other modes include interstate commuter rail and estimated non-reported transit ridership.

Public Transportation Continues Growth In 2009

During the first six months of 2009, Americans took nearly 5.5 billion trips on public transportation, suggesting another banner year of ridership growth. Despite relatively low gasoline prices, an economic recession, and lower transit system revenues, public transportation growth is expected to continue at strong levels, annualized currently at about 2.5 percent. This growth reflects a favorable shift relative to VMT, which in the first quarter of 2009 declined by 1.7 percent.²⁵

Many systems throughout the country are experiencing double digit growth on top of gains seen last year. Much of this growth is occurring in smaller cities and suburban areas with modest transit services, in addition to traditional large cities that have extensive public transportation networks, as detailed in Table 5 and Table 6.

Transit Systems Facing Crisis

Ironically, just as transit systems are experiencing a growing demand for their service, budget cuts have made it increasingly difficult for many transit systems to continue providing current services, to say nothing of expanding to meet growing demand.

Last year, budgets of public transit systems across the country were affected as rapidly rising gas prices prompted many people to opt for transit, just as transit system operating costs were increasing due to mounting maintenance needs and volatile fuel prices. More recently, the economic downturn has impacted public transit systems through declines in local, regional

and state revenues. A tragic example of the consequences of these shortfalls is highlighted in the recent subway crash on the Washington D.C. Metro on June 22, 2009, where nine people were killed and more than 70 injured in June when a train slammed into another train stopped on the tracks near the Maryland state line, partly as a result of overdue maintenance needs.²⁶

The American Public Transit Association conducted a survey of transit agencies in May 2009 and found the following:

- The impacts of revenue decline are widespread, with more than 80 percent of public transit systems reporting flat or decreased local and/or regional funding. Revenue declines average more than 12 percent among agencies with a decrease in regional or local funding.
- More than 80 percent of transit systems have seen flat or decreased funding from state sources. Among those systems facing a decrease, the average decline was more than 20 percent with several reporting the elimination of all state funding.
- Among transit systems facing decreased local, regional and/or state funding, nearly nine in 10 (89 percent) had to raise fares or cut service; three in four (74 percent) have raised fares and more than 60 percent have cut service. Nearly half (47 percent) have both raised fares and cut service.

Table 5: Bus ridership growth, mid-year 2008 to mid-year 2009

Agency	City	State	Trips (1st half 2009)	Percent growth (1st half 2008 to 1st half 2009)
Unitrans - City of Davis/ASUCD	Davis	CA	2,074,567	8%
Fort Bend County Public Transportation	Houston	TX	60,161	8%
Placer County Department of Public Works	Sacramento	CA	37,698	7%
Long Beach Transit	Los Angeles-Long Beach-Santa Ana	CA	15,024,816	7%
Golden Gate Bridge, Highway and Transportation District	San Francisco-Oakland	CA	26,058	7%
Metropolitan Transit Authority of Black Hawk County	Waterloo	IA	229,027	7%
City of Long Beach	New York-Newark	NY-NJ-CT	195,168	7%
Intercity Transit	Olympia-Lacey	WA	2,249,983	7%
Everett Transit	Seattle	WA	1,295,040	6%
Culver City Municipal Bus Lines	Los Angeles-Long Beach-Santa Ana	CA	3,014,231	6%
City of Union City Transit Division	San Francisco-Oakland	CA	230,525	6%
Coralville Transit System	Iowa City	IA	260,972	6%
City of Tucson	Tucson	AZ	10,537,255	5%
Riverside Transit Agency	Riverside-San Bernardino	CA	3,234,389	5%
Thousand Oaks Transit	Thousand Oaks	CA	90,252	5%
University of Iowa	Iowa City	IA	1,924,503	5%
Fayette Area Coordinated Transportation	Uniontown-Connellsville	PA	59,245	5%
City of Greeley - Transit Services	Greeley	CO	260,585	4%
Butte County Association of Governments	Chico	CA	633,370	4%
San Diego Metropolitan Transit System	San Diego	CA	14,380,191	4%
Iowa City Transit	Iowa City	IA	994,639	4%
Ben Franklin Transit	Kennewick-Richland	WA	1,926,326	3%
City of Los Angeles Department of Transportation	Los Angeles-Long Beach-Santa Ana	CA	16,204,218	3%
Fond du Lac Area Transit	Fond du Lac	WI	67,552	3%
Chula Vista Transit	San Diego	CA	1,753,821	3%
Santa Monica's Big Blue Bus	Los Angeles-Long Beach-Santa Ana	CA	10,544,959	3%
Ann Arbor Transportation Authority	Ann Arbor	MI	2,954,922	3%
Bettendorf Transit System	Davenport	IA-IL	86,646	3%
Golden Empire Transit District	Bakersfield	CA	3,659,520	2%
Mass Transit Department - City of El Paso	El Paso	TX-NM	6,328,433	2%
Peninsula Corridor Joint Powers Board	San Francisco-Oakland	CA	762,894	2%
Las Cruces Area Transit	Las Cruces	NM	316,301	1%
Placer County Department of Public Works	Sacramento	CA	400,666	1%
Hudson Transit Lines, Inc.	New York-Newark	NY-NJ-CT	1,744,899	1%
Charlottesville Transit Service	Charlottesville	VA	855,405	1%
City of Alexandria/Martz Group	Washington	DC-VA-MD	1,965,796	1%

Table 6: Light rail ridership growth, mid-year 2009 compared to mid-year 2008

Light Rail Ridership Increases - Mid Year 2009 Compared to Mid Year 2008				
Agency	City	State	Trips (Jan 09 to Jun 09)	Percent growth (from Jan 08 to Jun 08)
Massachusetts Bay Transportation Authority	Boston	MA-NH-RI	52,300,400	26%
San Francisco Municipal Railway	San Francisco-Oakland	CA	24,811,088	20%
North County Transit District	San Diego	CA	857,078	19%
King County Department of Transportation - Metro Transit Division	Seattle	WA	211,089	15%
Sacramento Regional Transit District	Sacramento	CA	8,536,500	10%
Los Angeles County Metropolitan Transportation Authority	Los Angeles-Long Beach-Santa Ana	CA	22,646,322	3%
Denver Regional Transportation District	Denver-Aurora	CO	9,857,338	1%

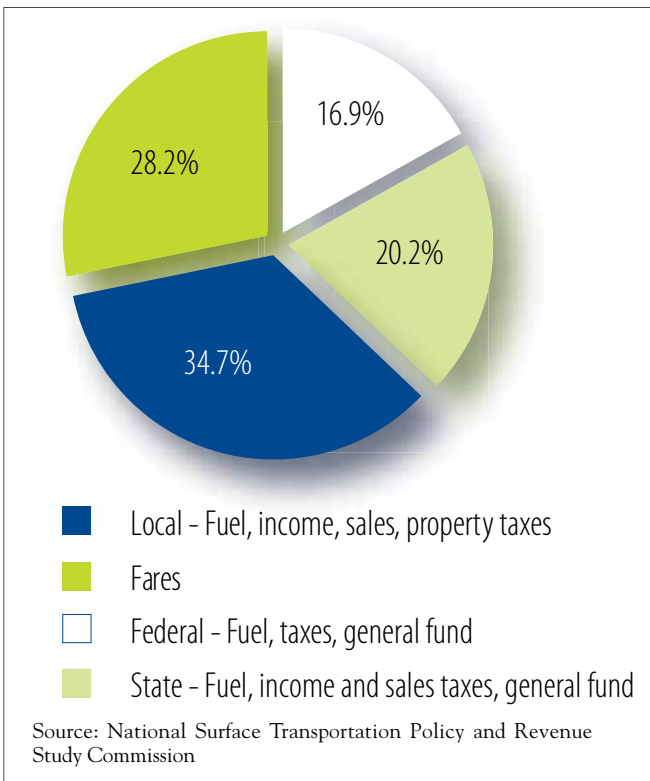
Source: National Transit Database

- Among those public transit systems reducing service, nearly two-thirds (65 percent) have eliminated or reduced off-peak service and nearly half (48 percent) have reduced the geographic coverage of public transit service.
- More than 60 percent of participating agencies reported higher ridership in the first quarter of

2009 over the same period last year despite declining economic conditions, lower fuel prices, and in some cases higher fares and decreased service.

- As agencies continue to face budget constraints, additional actions are under consideration with two-thirds of transit agencies considering service cuts, and one-half considering fare increases, some for the second time.

Table 7: Transit revenue breakdown, 2005



The dire straits of many transit agencies result from a long term trend of declining funding support. Transit revenues come from a variety of sources, according to the breakdown in Table 7.

In recent years, the amount of revenues flowing to transit maintenance, operations and expansion has not kept pace with increasing demand for services, since fares cover only a portion of transit service and system costs. In 2002, total revenues for public transportation provided \$4.71 per transit trip from all sources—federal, state and local funding, along with passenger fares—which has fallen to \$4.48 per trip in 2008 (adjusting for inflation), as illustrated below. If the disparity between resources and demand continues to grow, our national transit network will become increasingly less and less able to meet the daily transportation needs of millions of citizens, as well as limit the tremendous potential energy savings and environmental benefits from public transportation.

Many transit systems are facing the difficult task of reducing service and/or raising fares in order to sustain operations, as detailed below. The benefits of increased usage of public transportation cuts both ways, as both large and smaller transit systems attempt to balance growing user needs with increasingly limited resources.

Table 8: Transit revenue per trip, all sources 2002-2008

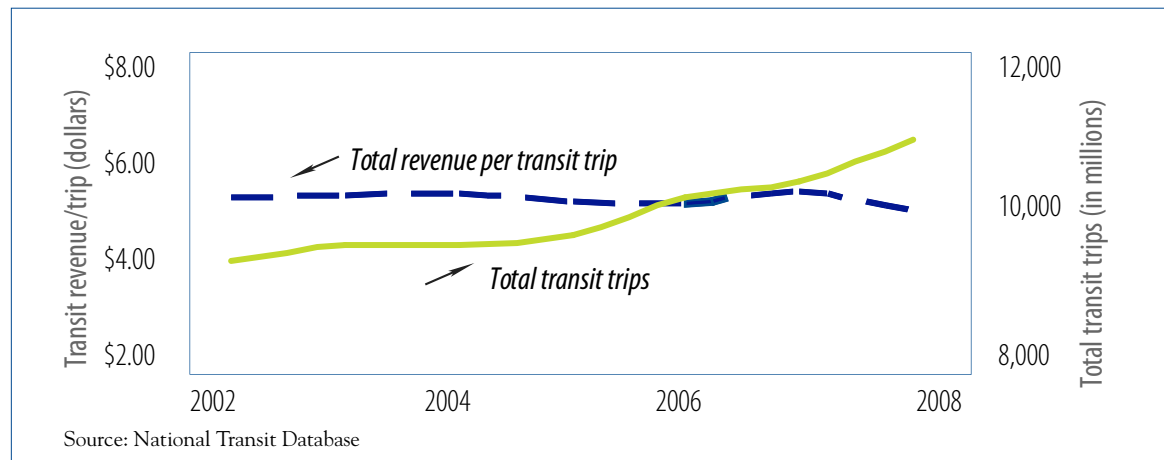


Table 9: Transit agencies facing service reductions and/or fare increases, 2009

City	State	Agency	Service Cut?	Fare Increase?
Kingman	AZ	Kingman Area Regional Transit	Y	
Phoenix Metro	AZ	Valley Metro	Y	40%
Alameda/Contra Costa Counties	CA	AC Transit	Y	14%
Chico	CA	Butte Regional Transit		40%
Contra Costa County	CA	County Connection	Y	14%
Contra Costa County	CA	Tri-Delta Transit		40%
Contra Costa County	CA	WestCAT	Y	
Hollister County	CA	San Benito County Express	Y	
Long Beach	CA	Long Beach Transit		22%
Monterey	CA	Monterey-Salinas Transit		20%
Norwalk	CA	Norwalk Transit	Y	20%
Orange County	CA	Orange County Transportation Authority	Y	20%
Riverside	CA	Riverside Transit Agency	Y	
Sacramento	CA	Regional Transit	Y	13%
San Bernadino	CA	Omnitrans		12%
San Diego	CA	Metropolitan Transit System	Y	13%
San Francisco	CA	San Francisco Municipal Transportation Agency	Y	33%
San Francisco-San Jose-Gilroy	CA	Caltrain	Y	11%
San Francisco Bay Area	CA	Bay Area Rapid Transit	Y	17%
San Joaquin	CA	San Joaquin Regional Transit District	Y	
San Jose	CA	Santa Clara Valley Transportation Authority	Y	14%
San Luis Obispo	CA	San Luis Obispo Regional Transit Authority		25%
San Mateo	CA	SamTrans	Y	17%
Santa Barbara	CA	MTD Santa Barbara	Y	40%
Santa Monica	CA	Santa Monica's Big Blue Bus	Y	
Sonoma County	CA	Sonoma County Transit	Y	

City	State	Agency	Service Cut?	Fare Increase?
Stockton-San Jose	CA	Altamont Commuter Express		3%
Torrance	CA	Torrance Transit		100%
Tri-Valley Region	CA	Livermore Amador Valley Transit Authority		14%
Vallejo	CA	Vallejo Transit	Y	
West Covina	CA	Go West - West Covina Shuttle Bus	Y	100%
Yolo County	CA	Yolobus	Y	33%
Colorado Springs	CO	Mountain Metropolitan Transit	Y	17%
Denver	CO	Regional Transportation District	Y	14%
Aspen	CO	Roaring Fork Transportation Authority	Y	21%
New Haven	CT	Greater New Haven Transit District	Y	
Washington	DC	WMATA	Y	
Miami	FL	Miami-Dade Transit		25%
Orlando	FL	Central Florida Regional Transportation Authority	Y	14%
Atlanta	GA	MARTA	Y	14%
Augusta	GA	Augusta Public Transportation		25%
Cedar Rapids	IA	Cedar Rapids Transit		25%
Arlington Heights	IL	PACE		17%
Chicago	IL	Chicago Transit Authority		14%
Madison County	IL	Madison County Transit		33%
Gary	IN	Gary Transit	Y	
Indianapolis	IN	IndyGo		17%
Boston	MA	MBTA	Y	33%
Cape Cod	MA	CCRTA	Y	
Baltimore	MD	Maryland Transit Administration	Y	
Cumberland	MD	Allegany County Transit	Y	
Montgomery County	MD	Montgomery County Ride On	Y	
Ann Arbor	MI	Ann Arbor Transportation Authority		25%
Berrien County	MI	Berrien County Transit	Y	25%
Detroit	MI	SMART		33%
Chaska	MN	SouthWest Transit	Y	17%
Minneapolis-St. Paul	MN	Metro Transit		29%
Johnson County	MO	Johnson County Transit		100%
St. Louis	MO	Metro		14%
Charlotte	NC	Charlotte Area Transit System	Y	
Moorhead	MN	Metro Area Transit		25%
Albuquerque	NM	ABQ RIDE	Y	
Las Vegas	NV	Regional Transportation Commission		40%
Reno	NV	Regional Transportation Commission	Y	
Binghamton	NY	BC Transit		25%
Buffalo	NY	Niagara Frontier Transportation Authority	Y	17%
New York City Metro	NY	Long Island RR		10%

City	State	Agency	Service Cut?	Fare Increase?
New York City Metro	NY	Metro North		10%
New York City Metro	NY	NYC Transit		13%
Syracuse	NY	Centro		25%
Cincinnati	OH	SW Ohio Regional Transit Authority	Y	
Cleveland	OH	Greater Cleveland Regional Transit Authority	Y	13%
Mansfield	OH	Richland County Transit		50%
Eugene	OR	Lane County Transit District	Y	20%
Portland	OR	TriMet	Y	
Salem	OR	Salem Area Mass Transit	Y	
Pittsburgh	PA	Port Authority of Allegheny County	Y	
Providence	RI	Rhode Island Public Transit Authority	Y	
Austin	TX	Capital Metropolitan Transportation Authority	Y	
Dallas	TX	Dallas Area Rapid Transit		17%
El Paso	TX	Sun Metro		25%
Houston	TX	Metro		4%
San Antonio	TX	VIA Metropolitan Transit		10%
Hampton Roads	VA	Hampton Roads Transit	Y	
Richmond	VA	Greater Richmond Transit Company	Y	
Clark County/Vancouver	WA	C-Tran		15%
Kitsap	WA	Kitsap Transit	Y	
Olympia	WA	Intercity Transit		33%
Seattle	WA	King County Metro Transit	Y	17%
Tacoma	WA	Pierce County Transit	Y	17%
Madison	WI	Metro Transit		33%
Milwaukee	WI	Milwaukee County Transit System		14%

Source: Transportation For America, Nelson Nygaard Consulting Associates, Transportation Equity Network, Gamaliel Foundation, Environment America Research and Policy Center.

Opportunities and Recommendations

Public Transportation—Where Are We Going?

An economic recovery will partially alleviate the funding crisis faced by some transit agencies, as local property tax revenues and state budgets (primary sources for both operating and capital expenses) rebound and provide much-needed funding to make system upgrades and particularly to sustain day-to-day operations. However, a business-as-usual approach of sustaining investment at current levels over time would see eventual diminishing returns in terms of transit versus automobile usage. Such an approach would see transit usage relative to driving level off through 2020, then decline in subsequent years.²⁷

Many indicators show that many Americans wish to follow a different path and decrease their car dependency, because they see the benefits of public transportation. In a 2003 survey, four in five Americans stated that increased investment in public transportation strengthens the economy, saves energy, creates jobs, helps reduce traffic congestion and decreases air pollution.²⁸ On Election Day 2008 people overwhelmingly voted to increase taxpayer support of public transportation, with more than 75 percent of state and local transit-related ballot measures passing. Last year, voters approved legislation in 16 states passing 26 measures and authorizing investments of \$75 billion in public transportation.²⁹

These indicators, coupled with expanding growth in public transportation ridership demonstrated in this report, suggest an appetite for greatly increased transit services, not just in big cities but in smaller cities, towns and suburbs across the country.

Growing demand and preference for transit warrant an overhaul of public transportation policy, rather than a business-as-usual approach. This would fully capitalize on the growth opportunity evidenced in 2008 and 2009, deliver significant energy and environmental benefits, and put the nation firmly on track to energy independence.

Such an overhaul could take the form of setting a high yet realistic target for increasing transit ridership by 10 percent annually. This level was achieved across many states and transit systems in 2008 and 2009, and in 15 years such an approach could reduce transportation oil consumption by 20 billion gallons per year—equivalent to what we currently import from the Persian Gulf.³⁰ This would also result in an annual reduction of 180 million tons of carbon dioxide pollution—more than four times the current benefit conferred by public transportation.

In 30 years, a 10 percent annual growth in transit ridership would save more than 80 billion gallons of gasoline per year, more than three-quarters of the oil that America consumes currently for transportation. Also, carbon dioxide emissions

would be cut by more than 700 million tons per year, or 12 percent of current total U.S. emissions.

Coupled with predicted advances in low carbon transportation fuels and progressively stronger CAFE standards, 10 percent annual growth would significantly grow transit's share of trips versus automobiles in such a manner that improves mobility and access while reducing both per-capita and total VMT. Overall, these three elements—cleaner fuels, highly efficient cars, and decreasing miles traveled—would enable transportation emissions to decrease 80 percent by 2050 (in line with national climate change targets) as well as reduce oil consumption to levels supportable by current domestic production.

This level of public transportation growth would reveal itself not only in the high-growth areas and metropolitan areas with extensive transit infrastructure identified in this report, but also in smaller towns and communities that presently have minimal yet highly-sought public transportation services.

Existing systems would undergo significant expansion, allowing the largest urban systems to expand heavy rail and grow light rail and bus rapid transit systems linking urban centers and suburban areas. Commuter rail and new high-speed rail



▲ *Four in five Americans believe increased investment in public transportation strengthens the economy, saves energy, creates jobs, helps reduce traffic congestion and decreases air pollution. (Photo - Santa Clara Valley Transportation Authority)*

would grow to accommodate a larger share of travel currently provided by cars and air travel, further improving energy and emissions benefits, relieving congestion and linking vital towns and employment centers. Mid-sized cities would initiate and grow efficient light rail, enhanced bus and demand-response service, initiatives that would be even more effective within the nation's smaller cities and towns that currently have limited or minimal transit systems.

Ideally, the land use changes entailed by such an overhaul would not only provide numerous, cleaner mobility options to commuters and families, but also make employment, services and entertainment more easily accessible to non-drivers and reduce automobile trip lengths, resulting in significant additional energy and emissions savings.

Conclusion

Strengthening our nation's public transportation infrastructure is vital to ensure we keep people mobile while reducing our dependence on oil and cutting global warming pollution. Given expected population and economic growth, dwindling availability of land, increasingly overburdened highways and bridges, and depletion of finite oil supplies, we need to take action now to move to a more efficient transportation system.

A century ago, trolleys and streetcars—the precursor of today's modern light rail and subway systems—facilitated the growth of American cities large and small, giving people more trans-

portation options and making our urban areas more livable and vibrant. In the 1950's the interstate highway system transformed the way we moved by linking cities across a national road network and making automobiles the dominant form of transportation. It is time again to transform our transportation system, in order to meet the needs of a growing, diverse economy while also protecting our environment and making us more energy independent.

While recent investments, such as the \$17.7 billion in funding for transit, intercity and high-speed rail included in this year's American Recovery and Reinvestment Act, may have enabled public transportation agencies to upgrade and accelerate expansion, the following measures will help overhaul public transportation as a stronger and more vital component of our transportation system moving forward. We're calling on our local, state, and national leaders to:

- Issue overarching goals to reduce oil dependence and pollution through transportation, which will guide better policy decisions by:
 - o Creating a national standard for reducing oil consumption and pollution through transportation. Federal transportation policy has not had an overarching performance goal since the development of the interstate highway system. This lack of direction has led to many negative outcomes, particularly increased oil dependence and global warming pollution. Reducing oil consumption and pollution must be factored with mobility and livability considerations in determining federal transportation investments.
 - o Integrating these energy and pollution goals in transportation and land-use planning at the state and local level.
- Increase investment in cleaner public transportation to include transit, high-speed rail, and better walking and biking by:
 - o Prioritizing federal funding for transit and cleaner transportation options that are much more effective at reducing energy consumption and pollution; and
 - o "Flexing" more eligible state and federal funding toward public transportation. State departments of transportation have enormous latitude on how federal money is spent once it is allocated to the state. Frequently, it is directed towards projects that do little to reduce oil dependence or pollution, since federal funding is apportioned to each state based on formulas that end up rewarding higher fuel consumption, lane-miles of highway, and VMT. These formulas should



▲ Four in five Americans believe increased investment in public transportation strengthens the economy, saves energy, creates jobs, helps reduce traffic congestion and decreases air pollution. (Photo - David Sugden)

be revised so funding provides incentives to reduce, not increase, oil use and pollution.

- Level the playing field in terms of funding and approving transit projects relative to road projects. Two sets of rules govern the process for approving new capital investments in transit and highway projects. The bar for new capital investment in transit is much higher, and the federal match ratio much lower than for highway development. Approval of transit and highway capital investments should be governed by an equivalent set of rules and matching ratios.
- Increase funding for transit maintenance and day-to-day operations, in addition to improving and expanding capacity. Transit systems face growing demand, but are having to reduce service and/or raise fares in order to stay afloat. Federal, state and local funds should allow for greater flexibility in funding operations—new buses and trains are useless without drivers to drive them and mechanics to maintain them.

By taking these approaches, we can create a future where every American can get to work and school via public transportation—subways, rail, buses, walking, and biking. People are voting with their feet and moving to public transportation in increasing numbers—it is imperative that policy and investments accentuate and accelerate this trend in order to achieve energy independence and solve global warming.



▲ *The recent American Recovery and Reinvestment Act, funding projects such as this future transit center in Aberdeen, Washington, has accelerated transit expansion. (Photo—Washington Department of Transportation)*

Methodology

Transit trips in this analysis are defined as the number of times passengers board public transportation vehicles for travel, to include bus, commuter rail, light rail (streetcars and rail-guided trolleys), heavy rail (subways), trolleybuses, paratransit (demand response buses and vans), vanpools and other rail modes. Passengers are counted each time they board a vehicle to travel from their origin to their destination and regardless of whether they transfer vehicles, pay a fare, use a pass or transfer, ride for free, or pay some other fee.

This report counts these trips as reported to individual transit agencies, which are then aggregated on a state-by-state basis based on the location of the agency. This analysis does not account for trips that end in a state different than the origin. However, most transit trips consist of round-trip daily commuting and the number of trips that are one-way travel to a permanent destination outside the state of origin can be estimated to be negligible. This may not be the case, however, for interstate commuter rail trips, which are not calculated for individual states in this analysis.

To calculate gasoline savings from public transportation usage, gasoline consumption is estimated for all trips based on average transit trip length across all modes, versus comparable automobile travel, based on data from the American Public Transportation Association (APTA) and U.S. Environmental Protection Agency (U.S. EPA). Petroleum used by the national public transportation fleet as reported by APTA is then subtracted from this total. Additional fuel benefits from improved traffic flow due to reduced congestion and secondary land use benefits, to include reduced travel distances based on the availability of transit, are then calculated, based on an analysis of transportation patterns in 85 U.S. cities by the Texas Transportation Institute. The total fuel savings from transit usage resulting from these methods is then divided among trips reported by individual transit agencies on a state-by-state basis.

Gasoline equivalent for automobiles are calculated by dividing this fuel savings by the average fuel economy of 20.8 miles per gallon for the current national automobile fleet, and the national average of 12,000 miles driven per automobile per year, as estimated by the U.S. EPA. Reduction in carbon dioxide pollution is then calculated at 5.2 metric tons emitted per automobile per year, also according to U.S. EPA data.

For 2008, not all states have publicly reported final estimated traffic counts in terms of Vehicle Miles Traveled (VMT). Where available, survey data from the Governors Highway Safety Association was used to estimate 2008 VMT, in addition to state and national VMT data from the Federal Highway Administration's annual and monthly Traffic Volume Trends reports.

Endnotes

1. United States Energy Profile, U.S. Energy Information Agency (U.S. EIA), 18 August 2009: tonto.eia.doe.gov/country/country_energy_data.cfm?fps=US; How Dependent Are We on Foreign Oil? U.S. EIA, 23 April 2009: tonto.eia.doe.gov/energy_in_brief/foreign_oil_dependence.cfm
2. Annual Energy Review 2008, U.S. EIA, 26 June 2009: www.eia.doe.gov/pub/oil_gas/petroleum/analysis_publications/oil_market_basics/demand_text.htm#U.S.%20Consumption%20by%20sector; United States Energy Profile, U.S. EIA, 18 August 2009.
3. Ibid.
4. Biofuels: DOE Lacks a Strategic Approach to Coordinate Increasing Production with Infrastructure Development and Vehicle Needs, General Accounting Office, Report number GAO-07-713, 11 June 2007.
5. On the Road to 2035: Reducing Transportation's Petroleum Consumption and GHG Emissions, Massachusetts Institute of Technology Laboratory for Energy and the Environment, July 2008.
6. United States Energy Profile, U.S. EIA, 18 August 2009.
7. 10.7 Billion Trips Taken On U.S. Public Transportation In 2008—Highest Level in 52 Years, American Public Transportation Association (APTA), 9 March 2009: www.apta.com/media/releases/090309_ridership.cfm
8. Individual Monthly Motor Vehicle Travel in the U.S. for December 2008, Federal Highway Administration, 6 February 2009.
9. Public Transportation Ridership Report, APTA, December 2008; Annual Estimates of the Resident Population for the United States, Regions, States, and Puerto Rico: April 1, 2000 to July 1, 2008; Monthly Estimates of the United States Population: April 1, 1980 to July 1, 1999; U.S. Census Bureau, 2008 and 2001; Traffic Volume Trends, Federal Highway Administration, 21 August 2009.
10. 2009 Public Transportation Fact Book, APTA, May 2009.
11. Ibid.; State Motor Vehicle Registrations, U.S. Department of Transportation (U.S. DOT) Bureau of Transportation Statistics (BTS), December 2007.
12. Conserving Energy and Preserving the Environment: The Role of Public Transportation, APTA, Robert J. Shapiro, Kevin A. Hassett and Frank S. Arnold, July 2002.
13. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007, U.S. Environmental Protection Agency (U.S. EPA), April 2009.
14. Light-Duty Automotive Technology and Fuel Economy Trends: 1975 Through 2008, U.S. EPA, September 2008; Emission Facts: Average Carbon Dioxide Emissions Resulting from Gasoline and Diesel Fuel; U.S. EPA, February 2005.
15. Transportation Vision 2030; U.S. DOT Research and Innovative Technology Administration, February 2008.
16. Transportation for Tomorrow, National Surface Transportation Policy and Revenue Study Commission, Chapter 2, Section 3, December 2007.
17. State Motor Vehicle Registrations, U.S. DOT BTS, December 2007; World Statistics Pocketbook, United Nations, 2008.
18. Source Water Protection Practices Bulletin: Managing Storm Water Runoff to Prevent Contamination of Drinking Water, U.S. EPA, July 2001.
19. Short-Term Energy Outlook, U.S. EIA, 11 August 2009.
20. Pay-As-You-Drive Pricing and Insurance Regulatory Objectives, Todd Litman, Journal of Insurance Regulation 23 (3); 2005; Fuel Price Increases and Impact on Driver Behavior, Federal Highway Administration, June 2007.
21. The Broader Connection Between Public Transportation, Energy Conservation and Greenhouse Gas Reduction, ICF International, 2008.
22. Ibid.
23. Traffic Facts and Figures, ABC News, 13 February 2005.
24. Urban and Rural Population, Census 2000 Summary File 3, U.S. Census Bureau, July 2007.
25. Ibid.
26. NTSB: DC train system had chronic signal problems, Associated Press, 23 July 2009.
27. Transportation for Tomorrow, National Surface Transportation Policy and Revenue Study Commission, December 2007.
28. Changing the Way America Moves: Creating a More Robust Economy, a Smaller Carbon Footprint, And Energy Independence; APTA, January 2009.
29. Ibid.
30. How Dependent Are We on Foreign Oil? U.S. EIA, 23 April 2009.